A.D. 1853 . . . . N° 1682.

SPECIFICATION

OF

ROBERT GORDON.

FURNACES OF STEAM BOILERS.

LONDON:
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1854.

A.D. 1853 . . . . N° 1682.

Furnaces of Steam Boilers.

LETTERS PATENT to Robert Gordon, of Heaton Norris, in the County of Lancaster, Millwright and Engineer, for the Invention of "IMPROVEMENTS IN FURNACES USED WITH STEAM BOILERS FOR THE PURPOSE OF CONSUMING SMOKE AND ECONOMISING FUEL."

Sealed the 14th January 1854, and dated the 15th July 1853.

PROVISIONAL SPECIFICATION left by the said Robert Gordon at the Office of the Commissioners of Patents, with his Petition, on the 15th July 1853.

I, ROBERT GORDON, of Heaton Norris, in the County of Lancaster, Millwright and Engineer, do hereby declare the nature of the said Invention for "MY IMPROVEMENTS IN FURNACES USED WITH STEAM BOILERS FOR THE PURPOSE OF CONSUMING SMOKE AND ECONOMISING FUEL" to be as follows:—

The adoption of a series of rollers instead of ordinary grate bars, which rollers receive, at the end nearest the entrance to the furnace, th coals or fuel given by means of the "hopper," or other convenient apparatus, by means of a self-acting motion, and causing the rollers to revolve on their axis in such manner as to carry forward the coal or fuel to the opposite end of the furnace, and there to deposit the spent fuel or ashes, except such as may have escaped through the crevices in the range of rollers as the fuel passed over the same, which process will consume the smoke arising from the burning of the fuel, and so economise the consumption of the latter.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Robert Gordon in the Great Seal Patent Office, on the 14th January 1854.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, ROBERT GORDON, of Heaton Norris, in the County of Lancaster, Millwright and Engineer, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Fifteenth day of July, in the year of our Lord One thousand eight hundred and fifty-three, in the seventeenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Robert Gordon, Her special licence that I, the said Robert Gordon, my executors, administrators, and assigns, or such others as I, the said Robert Gordon, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN FURNACES USED WITH STEAM BOILERS FOR THE PURPOSE OF CONSUMING SMOKE AND ECONOMISING FUEL,**" upon the condition (amongst others) that I, the said Robert Gordon, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Robert Gordon, do hereby declare the nature of my said Invention, and in what manner the same is to

A.D. 1853, JULY 15. N° 1682.
GORDON'S SPECIFICATION.

(ONE SHEET.)

Fig. 1.

SECTION.

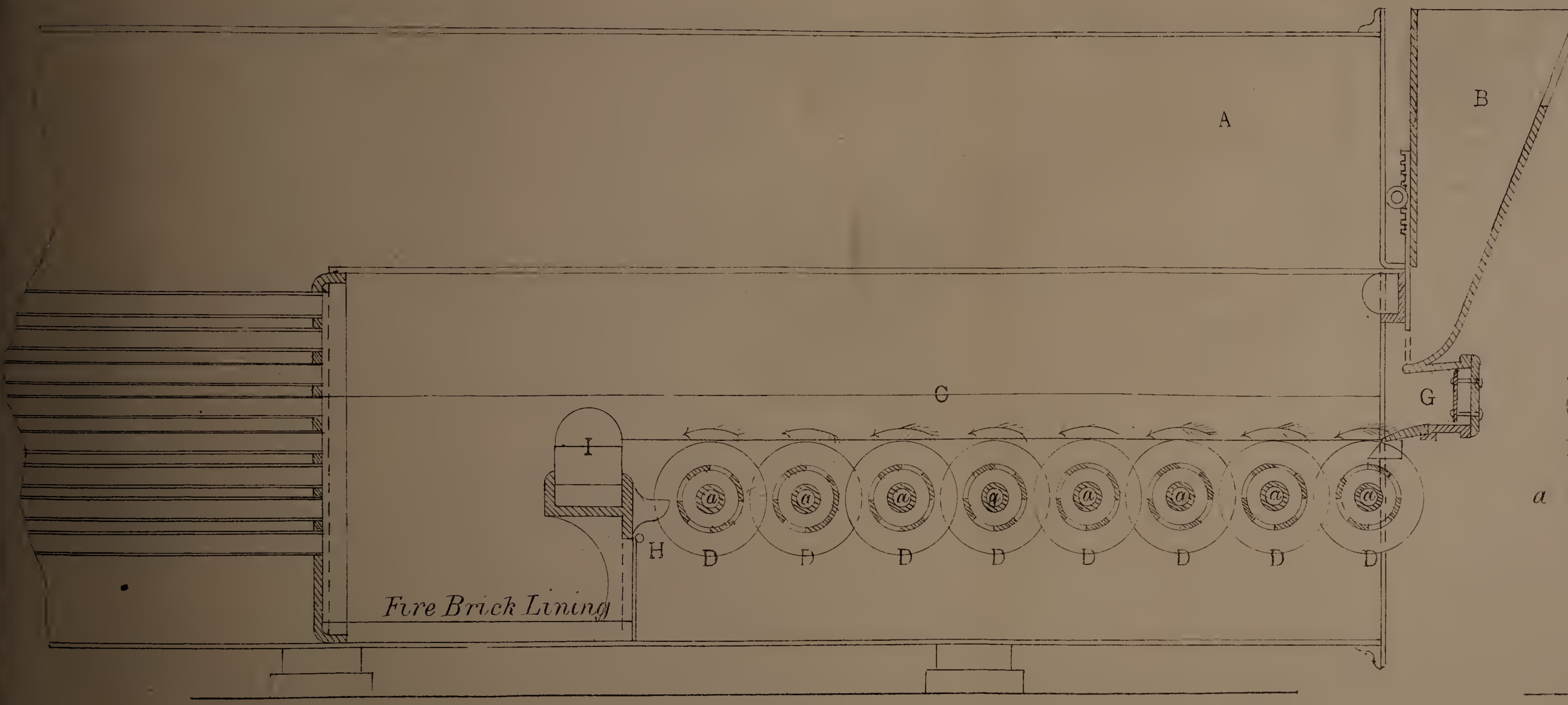
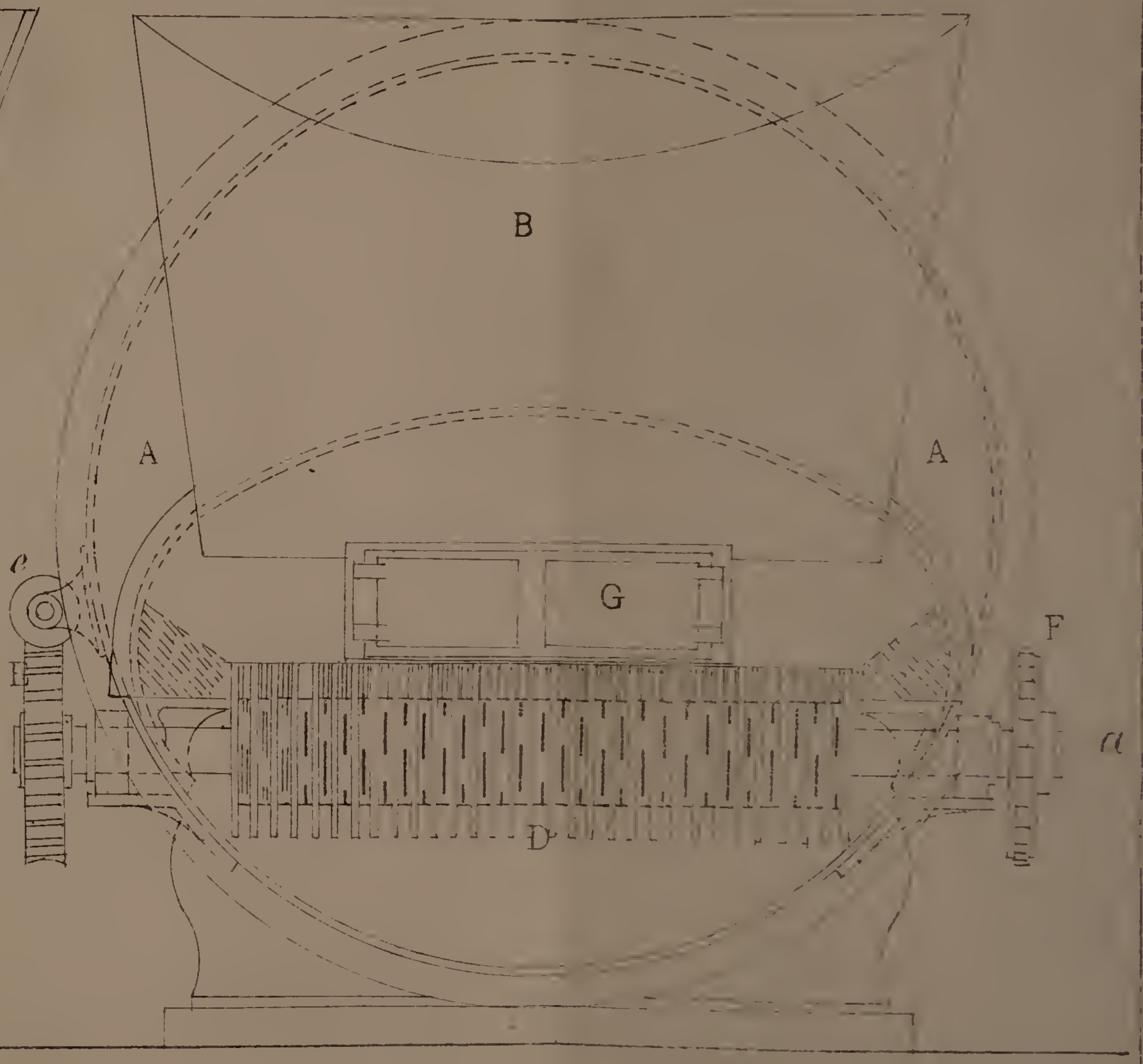


Fig. 2.

FRONT VIEW



Scale ½ an Inch to one Foot.

THE FILED DRAWING IS NOT COLORED.

Prosser, Lith.

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Printers to the Queen's most Excellent Majesty. 1854.

be performed, to be particularly described and ascertained in and by the following statement (that is to say):

It consists in the adaptation and arrangement of a certain apparatus by which the fuel supplied to the furnaces used with steam boilers is kept in a continuous motion from the point at which it is supplied to that at which it is expended or burnt out, and the manner in which the same is to be performed or carried into effect will be seen by reference to the annexed Drawing and the following description thereof, in which the same figures and letters of reference indicate the same parts throughout.

Figure 1, is a longitudinal sectional elevation of a portion of a boiler to which my improvements are applied, and Figure 2, is a front elevation of the same. In these Figures A, represents part of a multitubular steam boiler, provided with the usual furnace C, which is supplied by coal or other fuel from the hopper B. Thus far the arrangement is similar to that in ordinary use, but instead of using the ordinary grate bars I substitute a series of cylinders as represented at D. These cylinders are constructed of a series of disks or circular castings placed on hollow shafts *a*, parallel with each other, as best seen at Figure 2. Grate E, Figure 2, represents a worm wheel placed on the hollow shaft *a*, nearest to the mouth of the furnace G, which receives a slow rotation from the worm small *c*, also imparted to the whole series of cylinders by means of the chain and chain wheel F, as seen at Figure 2. The whole series of cylinders D, will then revolve in the direction indicated by the small arrows in Figure 1. Supposing, therefore, the fuel to be deposited from the hopper grate B, at the furnace mouth grate G, it will be slowly conveyed forward during its combustion on the upper surface of the cylinders D, until it is expended and deposited in the state of ash at the point H, just before it arrives at the bridge grate I, see Figure 1. The amount of air required for the complete combustion of the fuel is supplied through the hollow shafts *a*, and the openings in the several disks seen at Figure 2; and the speed at which the cylinders D, revolve is adjusted so as to allow the complete combustion of the fuel to take place during its transit from the furnace mouth grate G, until its arrival near the bridge grate I, and is finally deposited in the form of ash at the point grate H, as already described, see Figure 1.

By these improvements the fuel near the bridge I, will be in a state of complete combustion, while that deposited at G, from the hopper B, will be coking and giving off smoke which is necessarily consumed in its passage over the bright fire near to the bridge I, while the regular supply of fuel from hopper B, effects the economising of fuel.

Having now described the nature of my Invention, together with the manner in which the same may be performed and carried into effect, I hereby declare that I do not claim any of the separate or well known parts of the mechanical arrangement herein-before described; but I do claim the arrangement and adaptation of the series of cylinders revolving slowly in the same direction for the purpose of carrying the fuel under steam boilers as herein described, by which the smoke is consumed and the fuel economised.

In witness whereof, I, the said Robert Gordon, have hereunto set my hand and seal, this Thirteenth day of January, One thousand eight hundred and fifty-four.

ROBERT GORDON. (L.S.)

Witness to the signing, sealing,
and delivery hereof by the
said Robert Gordon,

CHA^s COOPER,
Sol^r, Manchester.

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